

WHAT IS CLAIMED IS:

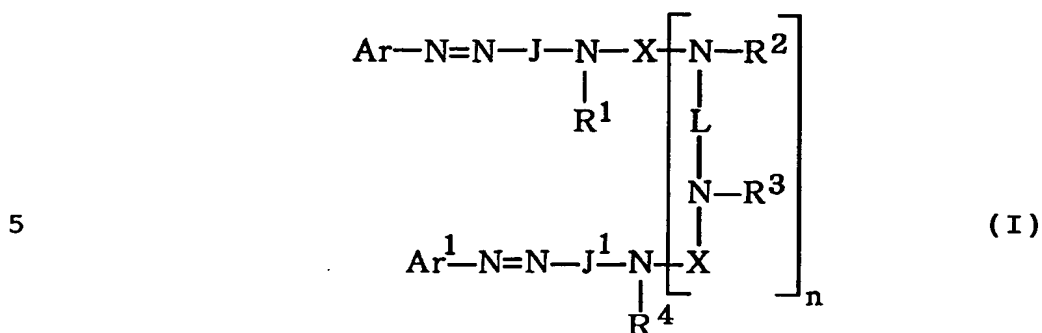
1. A fluorescent ink containing at least a coloring material and an aqueous liquid medium for dissolving the coloring material, wherein the coloring material comprises C.I. Acid Red 52 and at least one direct dye, the content of the C.I. Acid Red 52 ranging from 0.1 to 0.4% by weight based on the total amount of the ink, the content of the direct dye ranging from 0.11 to 0.4% by weight based on the total amount of the ink, and the weight ratio of the direct dye to the C.I. Acid Red 52 being not higher than 1.6.

2. The fluorescent ink according to claim 1, wherein the direct dye has two or more azo groups in the dye molecule.

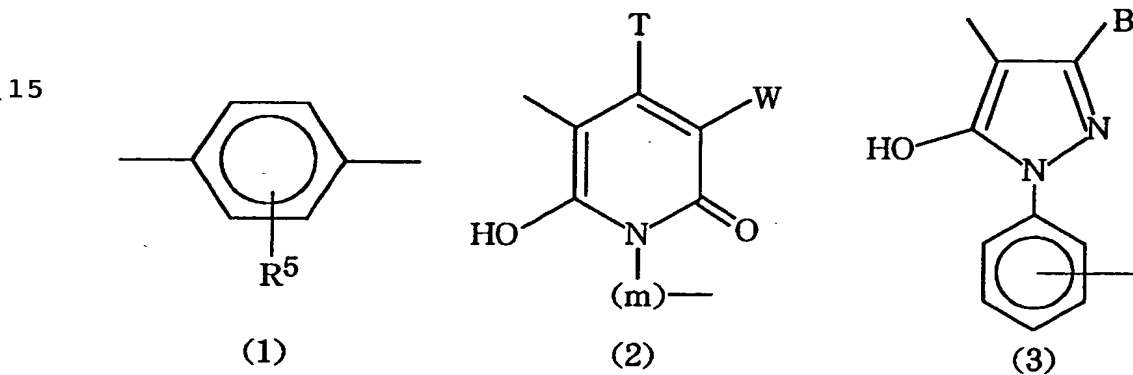
3. The fluorescent ink according to claim 2, wherein the direct dye has a dimer structure.

4. The fluorescent ink according to claim 1, wherein the direct dye has a color tone, in L*a*b* color space, of a* ranging from -20 to 60, b* ranging from -5 to 60, and of $\sqrt{(a^2+b^2)}$ of 30 or more.

5. The fluorescent ink according to claim 2, wherein the direct dye, in a free acid state, is represented by General Formula (I) below:



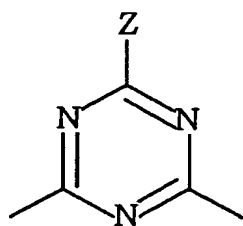
10 where Ar and Ar¹ are respectively a substituted or unsubstituted aryl group, and at least one of Ar and Ar¹ has a substituent selected from COOH and COSH; J and J¹ are respectively a group selected from the following General Formulas (1), (2), and (3):



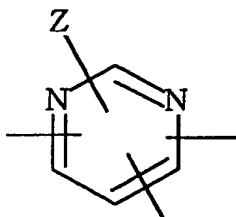
(In General Formula (1), R⁵ is independently selected from H, alkyls, substituted alkyls, alkoxy, halogens, CN, ureido, and NHCOR⁶; R⁶ being selected from H, alkyls, substituted alkyls, aryls, substituted aryls, aralkyls, and substituted aralkyls, in General Formula (2), T is an alkyl; W is selected from H, CN, CONR¹⁰R¹¹,

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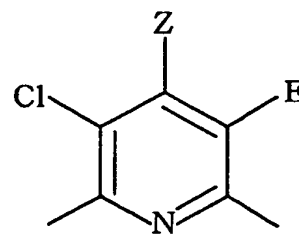
pyridium, and COOH; (m) is an alkylene chain of 2-8 carbon atoms; R^{10} and R^{11} are each selected from H, alkyls, and substituted alkyls, in General Formula (3), B is selected from H, and alkyls, and COOH.); and
 5 in General Formula (I), R^1 , R^2 , R^3 , and R^4 are respectively selected from H, alkyls, and substituted alkyls; L is a divalent organic bonding group; n is an integer of 0 or 1; X is a carbonyl, or one of General Formulas (4), (5), and (6):



(4)



(5)



(6)

(In General Formulas (4)-(6), Z is selected from OR^7 , SR^7 , and NR^8R^9 ; Y is selected from H, Cl, CN, and Z; E is selected from Cl and CN; R^7 , R^8 , and R^9 are respectively selected from H, alkenyls, substituted alkenyls, alkyls, substituted alkyls, aryls, substituted aryls, aralkyls, and substituted aralkyls; and R^8 and R^9 may form a five-membered or six-membered ring together with the nitrogen atom bonding therewith.); and
 20 the dye of General Formula (I) which does not have an SO_3H group has at least two groups selected from a COOH group and a COSH group, and the dye of General Formula

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(I) which has one or more SO_3H groups has groups selected from a COOH group and a COSH group at least in the same number as the number of SO_3H .

5 6. The fluorescent ink according to claim 1, wherein the aqueous liquid medium contains water.

10 7. The fluorescent ink according to claim 6, wherein the water is contained at a content ranging from 10 to 95% by weight based on the total weight of the ink.

15 8. The fluorescent ink according to claim 1, wherein the aqueous liquid medium contains a water-soluble organic solvent.

20 9. The fluorescent ink according to claim 8, wherein the water-soluble organic solvent is contained at a content of not more than 50% by weight based on the total weight of the ink.

25 10. The fluorescent ink according to claim 1, wherein the ink contains additionally a first organic compound and a second organic compound incompatible with each other, the first organic compound and the second organic compound being soluble or dispersible in the aqueous liquid medium.

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11. The fluorescent ink according to claim 10,
wherein the first organic compound and the second
organic compound are capable of dissolving or
dispersing C.I. Acid Red 52 and the direct dye.

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12. The fluorescent ink according to claim 10,
wherein one of the first organic compound and the
second organic compound has a solubility parameter of
not less than 15, and the other thereof has a
10 solubility parameter of not more than 13.

13. The fluorescent ink according to claim 10,
wherein the first organic compound and the second
organic compound are respectively a nonpolar compound.

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14. The fluorescent ink according to claim 10,
wherein the first organic compound and the second
organic compound are both water-soluble.

20

15. The fluorescent ink according to claim 10,
wherein the first organic compound and the second
organic compound are both liquid.

16. The fluorescent ink according to claim 10,
25 wherein one of the first organic compound and the
second organic compound has a glycerin group.

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5 18. The fluorescent ink according to claim 10,
wherein the first organic compound and the second
organic compound are both liquid at an ordinary
temperature.

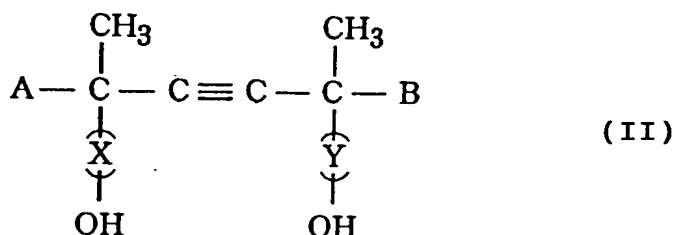
20. The fluorescent ink according to claim 19,
15 wherein the nonionic surfactant is liquid at an
ordinary temperature.

22. The fluorescent ink according to claim 21,
wherein the nonionic surfactant is contained in the ink
in an amount not to cause separation at the interface
of the ink when the ink contains no coloring material.

23. The fluorescent ink according to claim 19,

wherein the nonionic surfactant has an acetylene group.

24. The fluorescent ink according to claim 23,
wherein the nonionic surfactant has a structure
5 represented by the following General Formula (II):



10 wherein A and B are independently $\text{C}_n\text{H}_{2n+1}$ (n is an integer of 1 to 10), and X and Y are an open-ring ethylene oxide unit and/or an open-ring propylene oxide unit.

15 25. The fluorescent ink according to claim 19,
wherein the nonionic surfactant is contained at a content of not lower than 1% by weight based on the total weight of the ink.

20 26. The fluorescent ink according to claim 10,
further containing a monohydric alcohols.

25 27. The fluorescent ink according to claim 10,
wherein the counter ion of the hydrophilic group of the direct dye is ammonia.

5 29. The fluorescent ink according to claim 28,
wherein the urea derivative is not an acyclic compound.

31. The fluorescent ink according to claim 10,
15 wherein the coloring materials of the ink has two
counter ions, one of which is an ammonium ion and the
other is an alkali metal ion.

25 33. The fluorescent ink according to claim 1,
wherein the ink has a surface tension of not more than
40 mN/m (dyn/cm).

34. The fluorescent ink according to claim 1,
wherein the ink has pH of not lower than 8.

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5 35. The fluorescent ink according any one of
claims 1 to 34, being applied to a recording medium
from an ink supply means, wherein there is a gap
between the ink supply means and the recording medium.

10 36. The fluorescent ink according any one of
claims 1 to 34, being used for ink-jet recording.

15 37. A recording unit, comprising an ink
container containing the fluorescent ink according to
claim 36, and a head for ejecting the ink.

38. The recording unit according to claim 37,
wherein the head has such a constitution as to eject
the ink by applying thermal energy to the ink.

20 39. The recording unit according to claim 37,
wherein the ink container comprises polyolefins.

25 40. The recording unit according to claim 39,
wherein the ink container has an ink-holding member
therein.

41. The recording unit according to claim 40,

wherein the ink-holding member comprises at least one material selected from the group consisting of polyurethanes, cellulose, polyvinyl acetate, and polyolefins.

42. The recording unit according to claim 40, wherein the ink-holding member is constituted of a polymer of an inorganic compound.

43. The recording unit according to claim 40, wherein the ink-holding member is a porous material.

44. The recording unit according to claim 43, wherein the ink-holding member has a face being in contact with the ink container.

45. The recording unit according to claim 40, wherein the ink-holding member has a multiple layer structure.

47. The recording unit according to claim 46, wherein the ink-holding member has a face being in

48. The recording unit according to claim 40,
wherein the ink-holding member is a fiber flocculate.

49. The recording unit according to claim 48, wherein the fiber flocculate is aligned in an ink discharging direction of the ink container.

50. The recording unit according to claim 49, wherein the ink-holding member has a face being in contact with the ink container.

51. An ink cartridge comprising an ink container containing the fluorescent ink according to claim 1.

52. An ink cartridge comprising an ink container containing the fluorescent ink for ink-jet recording according to claim 36.

53. The ink cartridge according to claim 51 or 52, wherein the ink container comprises polyolefins.

54. The ink cartridge according to claim 53,
wherein the ink container has an ink-holding member
therein.

55. The ink cartridge according to claim 54,
wherein the ink-holding member comprises at least one
material selected from the group consisting of
polyurethanes, cellulose, polyvinyl acetate, and
5 polyolefins.

56. The ink cartridge according to claim 54,
wherein the ink-holding member is constituted of a
polymer of an inorganic compound.
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57. The ink cartridge according to claim 54,
wherein the ink-holding member is a porous material.

58. The ink cartridge according to claim 56,
15 wherein the ink-holding member has a face in contact
with the ink container.

59. The ink cartridge according to claim 51 or
52, wherein the ink-holding member has a multi-layer
20 structure.

60. The ink cartridge according to claim 59,
wherein the direction of the multi-layer arrangement of
the multi-layer structure is aligned in an ink
25 discharging direction of the ink container.

61. The ink cartridge according to claim 60,

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wherein the ink-holding member has a face in contact with the ink container.

62. The ink cartridge according to claim 54,
5 wherein the ink-holding member is a fiber flocculate

63. The ink cartridge according to claim 62,
wherein the fiber flocculate is aligned in an ink
discharging a direction of the ink container.

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64. The ink cartridge according to claim 63,
wherein the ink-holding member has a face being in
contact with the ink container.

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65. An ink-jet recording method comprising a
step of ejecting the fluorescent ink according to claim
36 by application of an energy to the ink.

66. The ink-jet recording method according to
20 claim 65, wherein the energy is a thermal energy.

67. An ink-jet recording apparatus comprising
an ink container containing the fluorescent ink
according to claim 36, and a recording head for
25 ejecting the ink.

68. The ink-jet recording apparatus according

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to claim 67, wherein the recording head has a heater
for applying the thermal energy to the ink for ejecting
the ink.

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